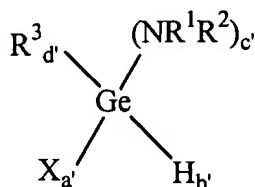


This listing of claims replaces all prior versions of claims in this Application.

### Listing of Claims

Claim 1. (Currently Amended) A method of depositing a film containing germanium on a substrate comprising the steps of:

a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula  $X^{1}_{4-a}GeR_a$ , wherein  $a = 0-3$ , each  $X^1$  is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and  $NR^3R^4$   $NR^4R^6$ , wherein each  $R^3$  and  $R^4$  and  $R^6$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula



wherein each  $R^1$  and  $R^2$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each  $R^3$  is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen;  $a' = 0-4$   $0-3$ ;  $b' = 0-4$   $0-3$ ;  $c' = 0-3$ ;  $d' = 0-4$   $d' = 1-4$  and  $a' + b' + c' + d' = 4$ ; provided that  $a' + b' \leq 3$  when  $X^1 = Cl$ ,  $R = H$ , and  $X = Cl$ ;

b) decomposing the two or more germanium compounds in the deposition chamber; and

c) depositing the film comprising germanium on the substrate.

Claim 2. (Original) The method of claim 1 wherein the two or more germanium compounds are provided from a single vapor delivery device.

Claim 3. (Original) The method of claim 1 wherein the first germanium compound is provided from a first vapor delivery device and the second germanium compound is provided from a second vapor delivery device.

Claim 4. (Original) The method of claim 3 wherein the first germanium compound is chosen from germanium tetrachloride and germanium tetrabromide.

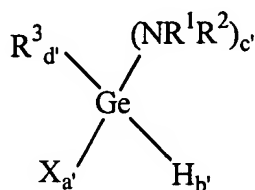
Claim 5. (Original) The method of claim 1 wherein  $c' = 1-3$ .

Claim 6. (Original) The method of claim 1 wherein  $a' = c' = 0$ ,  $b' = 1-2$  and  $d' = 2-3$ .

Claims 7-11. (Canceled)

Claim 12. (New) A method of depositing a film containing germanium on a substrate comprising the steps of:

a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula  $X^1_{4-a}GeR_a$ , wherein  $a = 0-3$ , each  $X^1$  is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and  $NR^4R^6$ , wherein each  $R^4$  and  $R^6$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, provided that the first germanium compound is chosen from  $GeCl_4$ ,  $GeBr_4$  and  $GeI_4$  when  $a = 0$  and each  $X^1$  is the same; and wherein a second germanium compound has the formula



wherein each  $R^1$  and  $R^2$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each  $R^3$  is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen;  $a' = 0-4$ ;  $b' = 0-4$ ;  $c' = 0-3$ ;  $d' = 0-4$  and  $a' + b' + c' + d' = 4$ ; provided that  $a' + b' \leq 3$  when  $X^1 = Cl$ ,  $R = H$ , and  $X = Cl$ ;

b) decomposing the two or more germanium compounds in the deposition chamber; and

c) depositing the film comprising germanium on the substrate.

Claim 13. (New) The method of claim 12 wherein  $d' = 1-4$ .

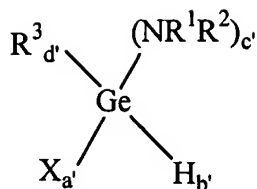
Claim 14. (New) The method of claim 12 wherein  $a = 1-3$ .

Claim 15. (New) The method of claim 12 wherein the first germanium compound is chosen from tetrachloro germane, tetrabromo germane, tetraiodo germane, chloro tribromo germane, dichloro dibromo germane, trichloro bromo germane, trichloro iodo germane, dichloro diiodo germane, trichloro iodo germane, tribromo iodo germane, dibromo diiodo germane, bromo triiodo germane, dichloro bromo iodo germane, chloro dibromo iodo germane, chloro bromo

diiodo germane, trichloro fluoro germane, dichloro difluoro germane, chloro trifluoro germane, tribromo fluoro germane, dibromo difluoro germane, bromo trifluoro germane, iodo trifluoro germane, diiodo difluoro germane, triiodo fluoro germane, chloro bromo iodo fluoro germane, dichloro bromo fluoro germane, chloro dibromo fluoro germane, dibromo iodo fluoro germane, bromo diiodo fluoro germane, dichloro iodo fluoro germane and chloro diiodo fluoro germane; and iso-propyl (dimethylamino) germanium dichloride; methyl (dimethylamino) germanium dichloride; methyl (dimethylamino) germanium dibromide; dichloro (diethylamino) germane; dichloro ethyl (diethylamino) germane; dichloro tert-butyl (diethylamino) germane; dichloro bis(dimethylamino) germane; and chloro ethyl (dimethylaminopropyl) (dimethylamino) germane; dichloro tert-butyl (dimethylamino) germane; chloro di-iso-propyl (dimethylamino) germane; trimethyl germanium chloride; methyl germanium trichloride; trimethyl germanium fluoride; trimethyl germanium bromide; tris(trifluoromethyl) germanium iodide; methyl germanium trifluoride; dimethyl germanium difluoride; dichloro methyl germane; dimethyl germanium dichloride; trimethyl germanium iodide; vinyl germanium trichloride; ethyl germanium trichloride; chloro tert-butyl dimethyl germane; allyl germanium trichloride; tert-butyl germanium trichloride; diethyl germanium dichloride; trimethyl germanium chloride; n-butyl germanium trichloride; trimethyl germanium bromide; di-n-butyl germanium dichloride; phenyl germanium dichloride; tri-n-butyl germanium bromide; tri-n-butyl germanium chloride; and benzyl germanium trichloride.

Claim 16. (New) A method of depositing a film containing germanium on a substrate comprising the steps of:

a) conveying two or more germanium compounds in a gaseous phase to a deposition chamber containing the substrate, wherein a first germanium compound is a halogermanium compound of the formula  $X^1_{4-a}GeR_a$ , wherein  $a = 0-3$ , each  $X^1$  is independently a halogen, and each R is independently chosen from H, alkyl, alkenyl, alkynyl, aryl, and  $NR^4R^6$ , wherein each  $R^4$  and  $R^6$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl, and wherein a second germanium compound has the formula



wherein each  $\text{R}^1$  and  $\text{R}^2$  are independently chosen from H, alkyl, alkenyl, alkynyl and aryl; each  $\text{R}^3$  is independently chosen from alkyl, alkenyl, alkynyl and aryl; X is halogen;  $a' = 0-4$ ;  $b' = 0-4$ ;  $c' = 0-3$ ;  $d' = 0-4$  and  $a' + b' + c' + d' = 4$ ; wherein at least one of  $a'$ ,  $c'$  and  $d'$  is not 0; provided that  $a' + b' \leq 3$  when  $\text{X}^1 = \text{Cl}$ ,  $\text{R} = \text{H}$ , and  $\text{X} = \text{Cl}$ ;

b) decomposing the two or more germanium compounds in the deposition chamber; and

c) depositing the film comprising germanium on the substrate.

Claim 17. (New) The method of claim 16 wherein the second germanium compound is chosen from alkyl germanes, amino germanes and halogermanium compounds.

Claim 18. (New) The method of claim 17 wherein the second germanium compound is chosen from tetramethyl germane, tetraethyl germane, tetra-n-propyl germane, methyl germane, dimethyl germane, trimethyl germane, ethyl germane, diethyl germane, trimethyl germane, dimethyl diethyl germane, tert-butyl methyl germane, tert-butyl dimethyl germane, tert-butyl trimethyl germane, tert-butyl ethyl germane, tert-butyl diethyl germane, tert-butyl trimethyl germane, tert-butyl iso-propyl germane, methyl tert-butyl iso-propyl germane, iso-propyl germane, di-iso-propyl germane, di-iso-propyl dimethyl germane, tri-iso-propyl germane, tri-iso-propyl methyl germane, di-iso-propyl diethyl germane, (dimethylamino) germane, bis-(dimethylamino) germane, methyl (dimethylamino) germane, ethyl (dimethylamino) germane, diethyl (diethylamino) germane, tert-butyl (dimethylamino)germane, tert-butyl bis(dimethylamino) germane, ethyl tert-butyl bis(dimethylamino) germane, iso-propyl (dimethylamino)germane, iso-propyl (diethylamino) germane, di-iso-propyl bis(dimethylamino) germane, n-propyl (dimethylamino) germane, n-propyl (diethylamino) germane; tert-butyl dimethyl germanium chloride, tert-butyl dimethyl germanium bromide, tert-butyl diethyl germanium chloride, tert-butyl diethyl germanium iodide, dimethyl germanium dichloride, trimethyl germanium chloride, trimethyl germanium bromide, tert-butyl germanium trichloride, iso-propyl germanium chloride, iso-propyl germanium trichloride, di-iso-propyl germanium

dibromide, iso-propyl dimethyl germanium chloride, iso-propyl methyl germanium dichloride, and iso-propyl dimethyl germanium bromide.

Claim 19. (New) The method of claim 16 wherein the two or more germanium compounds are present in a mole ratio of 5:95 to 95:5.

Claim 20. (New) The method of claim 19 wherein the two or more germanium compounds are present in a mole ratio of 25:75 to 75:25.